Petition to Amend Group IV Requirements in California Title 8 (Elevator Safety Orders)

Add item (19) to 3141.7, as follows:

(19) The detection means for the ascending car overspeed protection device required by ASME A17.1-2004, section 2.26.2.29 shall be permitted to be satisfied by another device specified in ASME A17.1-2004, section 2.26.2, provided that the device used complies with ASME A17.1-2004, section 2.19.1.2(a).

Rationale: The governor overspeed switch satisfies all of the requirements of ASME A17.1-2004, section 2.19.1.2(a), and there appears to be no other prohibition against using it (other than the fact that the permission to do so is not expressly granted in A17.1-2004). The proposed verbiage allows someone to use the governor overspeed switch as the ascending car overspeed detection means without telling them how to do their design.

Supporting information: The requirement for ascending car overspeed protection has been a part of the Canadian B44 code at least since 1994, and a part of the A17.1 codes since the 2000 edition, which first went into effect on March 23, 2002, where adopted in the U.S. Traditionally, the governor overspeed switch has been used as the typical detection means for ascending car overspeed in all other North American jurisdictions where ascending car overspeed protection is required. There is even a note in the section of the B44-94 standard, headed "Overspeed Protective Means," which states, "A mechanical linkage to the car whether or not such linkage is used for any other purpose may be used to assist in this performance" (please see a copy of the original Canadian B44 requirement, separately attached).

Following are the requirements of A17.1-2004, section 2.19.1.2(a), along with my comments **[in bold blue font]** on how the speed governor overspeed switch satisfies the requirements for the ascending car overspeed detection means:

> **2.19.1.2 Where Required and Function.** All electric traction elevators, except those whose empty car weight exceeds the total weight of the suspension ropes and counterweight, shall be provided with a device to prevent an ascending elevator from striking the hoistway overhead structure. This device (see 2.26.2.29) shall
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> > *(a)* detect an ascending car overspeed condition at a speed not greater than 10% higher than the speed at which the car governor is set to trip (see 2.18.2.1).
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> > **[Debbie Prince: The speed-governor overspeed switch is required by A17.1-2004, section 2.18.4.2.4 to open in**

the up direction at not more than 100% of the speed at which the governor is set to trip in the down direction, so it complies with this requirement.]

(1) If the overspeed detection means requires electrical power for its functioning

(a) a loss of electrical power to the ascending car overspeed detection and control means shall cause the immediate activation of the emergency brake as required in 2.19.1.2(b)

(b) the occurrence of a single ground, or the failure of any mechanically operated switch that does not meet the requirements of 2.26.4.3, any single magnetically operated switch, contactor, or relay, or any single solid-state device, or a software system failure, shall not render the detection means inoperative

[Debbie Prince: The speed-governor overspeed switch does not require electrical power for its functioning, so these requirements do not apply.]

(2) The failure of any single mechanically operated switch that does not meet the requirements of 2.26.4.3 shall not render the detection means inoperative.

[Debbie Prince: The speed-governor overspeed switch is required to comply with A17.1-2004, section 2.26.4.3, so this requirement does not apply.]

(3) When a fault specified in 2.19.1.2(a)(1)(b) or 2.19.1.2(a)(2) is detected, the car shall stop at or before the next landing for which a demand was registered, and shall not be permitted to restart.

[Debbie Prince: The speed-governor overspeed switch does not require electrical power for its functioning, and is required to comply with A17.1-2004, section 2.26.4.3, so this requirement does not apply.]

(4) Once actuated by overspeed, the overspeed detection means shall remain actuated until manually reset, and the car shall not start or run unless the detection means is reset.

[Debbie Prince: The speed-governor overspeed switch is required by 2.18.4.4 to be manually reset, which also meets this requirement.]

Following are additional A17.1 requirements referenced above for the car speed governor and the governor overspeed switch, for your reference:

2.18.2.1 Car Speed Governors. Speed governors for car safeties shall be set to trip at car speeds as follows:

(a) at not less than 115% of the rated speed.

(b) at not more than the tripping speed listed opposite the applicable rated speed in Table 2.18.2.1. Maximum tripping speeds for intermediate rated speeds shall be determined from Fig. 8.2.5. For rated speeds exceeding 10 m/s (2,000 ft/min), the maximum tripping speeds shall not exceed 120% of the rated speed.

2.18.4.2.4 The switch, when set as specified in either 2.18.4.2.1, 2.18.4.2.2, or 2.18.4.2.3, shall open in the up direction at not more than 100% of the speed at which the governor is set to trip in the down direction.

2.18.4.4 Type of Speed-Governor Overspeed Switches and Speed-Reducing Switches. Switches used to perform the function specified shall be positively opened. Overspeed and speed-reducing switches permitted by 2.18.4.2.5 and operated by the speed governor shall remain in the open position until manually reset.

2.26.2.10 Speed-Governor Overspeed Switch. A speed-governor overspeed switch shall be provided when required by 2.18.4.1 and shall conform to 2.18.4.1.2, 2.18.4.2, and 2.18.4.3.

2.26.4.3 The devices covered by 2.26.2 shall have contacts that are positively opened mechanically; their opening shall not be solely dependent on springs. Exceptions are devices described by 2.26.2.4, 2.26.2.19, 2.26.2.29, and 2.26.2.30; and 2.26.2.12 and 2.26.2.16 where magnetically operated, optical, or static-type switches are used.

(c) the driving-machine brake; or
(d) any other component on which the speed of the car is dependent, except in the case of the failure of the means of suspension (see Clause 3.16.1) and the failure of the overhead mounted gearless traction sheave.

It shall be assumed that any envisioned failure may occur while the car, loaded with any load up to its rated load (see also Clause 3.9.8.2(i)), may be stationary with its doors closed or travelling at any speed, in any part of the hoistway, between terminal landings.

3.16.3.1.2 Descending Car Overspeed Protection

A means conforming to Clause 3.16.3.2 shall be provided on every elevator having car suspended by wire ropes, except that on elevators equipped with a car safety and a speed governor in conformance with Clauses 3.7 and 3.8, no additional protection shall be required.

3.16.3.1.3 Ascending Car Overspeed Protection

A means, conforming to Clause 3.16.3.2 shall be provided on every counterbalanced elevator, where the counterbalance exceeds the mass of the empty car, except that on elevators equipped with a counterweight safety and a speed governor in conformance with Clause 3.7 and 3.8, no additional protection shall be required.

3.16.3.2 Overspeed Protective Means

The means required in Clause 3.16.3.1 shall conform to the following:
(a) It shall detect any uncontrolled movement of the car prior to or, at a minimum, at the time when the car reaches a predetermined overspeed, and shall cause the car to stop prior to the time when the car or counterweight strikes its buffers, or at least reduce the car speed to the speed for which the buffer is designed.
(b) It shall be capable of performing as required in (a) without assistance from any elevator component that solely, without built-on redundancy, controls the speed, or deceleration, or stops the car during normal operation.
Note: *A mechanical linkage to the car whether or not such linkage is used for any other purpose may be used to assist in this performance.*
(c) It shall not develop an average retardation of the car in excess of 9.81 m/s^2 (32.2 ft/s^2) during the stopping phase.
(d) It shall prevent dangerous, uncontrolled movement of the car by controlling the speed and acting upon one or more of the following:
- (i) the car;
- (ii) the counterweight;
- (iii) the suspension or compensating rope system;
- (iv) the traction sheave.

(e) When activated and during the stopping phase, it shall not impose stress on itself or any elevator component in excess of 30% of the ultimate strength of that component.
(f) The slowdown and stopping of the car during its normal operation, when no failure as referred to in Clause 3.16.3.1 has been detected, shall not be solely dependent on this means.
(g) When activated or during the stopping phase, this means or another elevator component shall cause the power supply to the driving machine to be interrupted.
(h) All components that require periodic inspection and maintenance to ensure operational reliability must be readily accessible.
(i) Its performance shall be checked during the acceptance inspection of the elevator (see Section 9).
(j) It shall be provided with a marking plate indicating the range of total masses for which it may be used and the speed at which it is set to operate.